GUIDELINE A-8

Guideline for the Implementation of Canada-wide Standards for Emissions of Mercury and of Dioxins and Furans

and

Monitoring and Reporting Requirements

for

Municipal Waste Incinerators

Biomedical Waste Incinerators

Sewage Sludge Incinerators

Hazardous Waste Incinerators

Steel Manufacturing Electric Arc Furnaces

Iron Sintering Plants

Legislative Authority:
Environmental Protection Act, Part V, Section 27, and Part II, Section 9
Ontario Regulation 347, General B Waste Management Regulation
Ontario Regulation 346, General B Air Pollution

Responsible Director:
Director, Standards Development Branch

June 10, 2003

103-06532/

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SYNOPSIS

This guideline establishes the formal adoption by Ontario of the Canada-wide Standards for emissions of mercury and of dioxins and furans from municipal waste, biomedical waste, sewage sludge and hazardous waste incineration systems in Ontario. This guideline also establishes the formal adoption by Ontario of the Canada-wide Standards for dioxin and furan emissions from steel manufacturing electric arc furnaces and iron sintering plants in Ontario

The Canadian Council of Ministers of the Environment (CCME) announced Canada-wide Standards for emissions of mercury from incineration systems on June 6, 2000 and of dioxins and furans on May 1, 2001. These Canada-wide Standards have been adopted by Ontario and are reflected in this guideline and in an updated Guideline A-7. The CCME also announced Canada-wide Standards for emissions of dioxin and furan from steel manufacturing electric arc furnaces and iron sintering plants on May 1, 2003.

This guideline applies to new and existing incinerators. Effective August 1, 2001, all new incinerators must demonstrate compliance with the mercury the dioxin and furan limits within six (6) months of start-up New steel manufacturing electric arc furnaces and iron sintering plants must comply with the dioxin and furan limits as of May 1, 2003. Existing incinerator, steel manufacturing electric arc furnaces and iron sintering plants will be required to demonstrate compliance through the inclusion of conditions in instruments such as Certificates of Approval at such time as these instruments take effect and prior to the end (December 31) of the years listed as ACompliance Date@ for the applicable limits for existing plants.

1.0 INTRODUCTION

This guideline establishes Ontario specific limits for emissions of mercury and of dioxins and furans applicable to four types of waste incinerators through adoption of the June 6, 2000 and May 1, 2001 Canada-wide Standards (www.ccme.ca). These limits will be applied by the ministry when reviewing AApplications for Approval@ for new incinerators, upgraded (expanded or modified) incinerators, and for other modifications to existing incinerators as necessary.

This guideline also establishes Ontario dioxin and furan emission limits for steel manufacturing electric arc furnaces and iron sintering plants through adoption of these Canada-wide Standards on May 1, 2003. These limits will be applied by the ministry when reviewing AApplications for Approval@ for new steel manufacturing electric arc furnaces and iron sintering plants, upgraded (expanded or modified) steel manufacturing electric arc furnaces and iron sintering plants (May 1, 2003), or for other modifications to existing steel manufacturing electric arc furnaces and iron sintering plants as appropriate.

A waste incinerator will be considered to be upgraded (expanded or modified) if, as a result of changes, the approved or rated waste throughput increases, the approved or rated heat input to the unit increases by any amount or if the emissions are predicted to substantially increase for any other reason in relation to changes proposed in an application made by the plant owner/operator. A steel manufacturing electric arc furnace will be considered to be upgraded (expanded or modified) if there is a complete replacement of the EAF or of the gas conditioning system, or if there is a cumulative 25 percent or more increase in the hourly steel production from the maximum hourly steel production rate achieved in the 5 years prior to May 1, 2003 through physical modifications to the EAF facility. An iron sintering plant will be considered to be upgraded (expanded or modified) if there is a complete replacement of the sintering machine or of the gas conditioning system, or if there is a cumulative 25 percent or more increase in the hourly sintering capacity from the sintering capacity existing as of May 1, 2003 achieved through physical modifications to the iron sintering plant.

This guideline supplements the requirements of Regulation 346 (RRO 1990), General B Air Pollution, including compliance with the point of impingement standards prescribed in Schedule 1 to that regulation. This guideline complements Guideline A-7 which applies to new municipal waste incinerators and Guideline A-1 which applies to all biomedical waste incinerators operating in the Province of Ontario as of December 6, 2003 (one year after O. Reg. 323/02 took effect).

2.0 GUIDELINE LIMITS

2.1 Mercury

New, upgraded and existing waste incinerators, with the exception of existing Asmall@ biomedical waste incinerators, shall meet the in-stack emission limits for mercury as set out in Table 1, below:

TABLE 1: MERCURY EMISSION LIMITS

Incinerator Type	Emission Limit	Compliance Date		Comments
		New or upgraded	Existing	
Municipal Waste	20 μg/Rm^3 **	June 7, 2000	2006	calculated as the arithmetic average of 3 stack tests
Biomedical Waste*	20 μg/Rm^3	June 7, 2000	2006	calculated as the arithmetic average of 3 stack tests
Hazardous Waste	50 μg/Rm^3	June 7, 2000	2003	calculated as the arithmetic average of 3 stack tests
Sewage Sludge	70 μg/Rm^3	June 7, 2000	2005	calculated as the arithmetic average of 3 stack tests

* Variation from the Canada-wide Standard for mercury, which differentiates between ALarge@ and ASmall@ units using a throughput capacity of 120 tonnes per year as the boundary between these two sizes and allows for the use of Adetermined efforts@ to meet the CWS (see section 2.3).

** μg/Rm^3 means micrograms per reference cubic metre at 25°C and 101.3 kilopascals pressure. Concentrations are also to be corrected to 11 percent oxygen and zero percent moisture (dry) for reporting and compliance purposes.

2.2 Dioxins and Furans

New, upgraded and existing waste incinerators, with the exception of existing Asmall@ biomedical waste incinerators, shall meet the in-stack emission limits for dioxins and furans as set out in Table 2, below:

TABLE 2: DIOXIN AND FURAN EMISSION LIMITS

Facility Type	Emission Limit	Compliance Date		Comments
		New or upgraded	Existing	
Municipal Waste Incinerator	80 pg I-TEQ/Rm^3 **	May 2, 2001	2006	calculated as the arithmetic average of 3 stack tests
Biomedical Waste Incinerator*	80 pg I-TEQ/Rm^3	May 2, 2001	2006	calculated as the arithmetic average of 3 stack tests
Hazardous Waste Incinerator	80 pg I-TEQ/Rm^3	May 2, 2001	2006	calculated as the arithmetic average of 3 stack tests
Sewage Sludge Incinerator	80 pg I-TEQ/Rm^3 100 pg I-TEQ/Rm^3	May 2, 2001 NA	NA 2005	calculated as the arithmetic average of 3 stack tests
Steel Manufacturing Electric Arc Furnace	150 pg I-TEQ/Rm^3 100 pg I-TEQ/Rm^3	NA May 1, 2003	2006 2010	calculated as the arithmetic average of 3 stack tests
Iron Sintering Plant	1350 pg I-TEQ/Rm^3 500 pg I-TEQ/Rm^3 200 pg I-TEQ/Rm^3	NA NA May 1, 2003	2002 2005 2010	calculated as the arithmetic average of 3 stack tests

* Variation from the Canada-wide Standard for dioxins and furans, which differentiates between ALarge@ and ASmall@ units using a throughput capacity of 26 tonnes per year as the boundary between these two sizes and allows for the use of Adetermined efforts@ to meet the CWS (see section 2.3).

** pg I-TEQ/Rm^3 means picograms of toxicity equivalents (calculated using the toxicity equivalence factors recommended by the North Atlantic Treaty Organizations Committee on Challenges to Modern Society [NATO/CCMS] in 1989 and adopted by Canada in 1990) to 2,3,7,8 tetrachloro dibenzo-*p*-dioxin per reference cubic metre at 25°C and 101.3 kilopascals pressure. Concentrations are also to be corrected to 11 percent oxygen and zero percent moisture (dry) for reporting and compliance purposes for incinerators. Concentrations are also to be corrected to zero percent moisture (dry), but do not need to be corrected for oxygen for reporting and compliance purposes for EAF and iron sintering plants.

2.3 Guideline Limits for Small Biomedical Waste Incinerators

Since the Canada-wide Standards for mercury and for dioxins and furans were published, Ontario has developed a revised Guideline A-1 for biomedical waste incinerators (October 2002). The requirements of that document supercede the provisions of the Canada-wide Standards and require biomedical waste incinerators of any size to meet the same emission limits for mercury and for dioxins and furans as those set for Alarge@ units under the Canada-wide Standards.

2.4 Guideline A-7: Combustion and Air Pollution Control Requirements for New Municipal Waste Incinerators

Guideline A-7 has been amended (October 2002) to incorporate the new dioxin and furan emission limit of 80 pg I-TEQ/Rm^3 as well as the new mercury emission limit of 20 $\mu g/Rm^3$ incorporated in September 2000.

3.0 COMPLIANCE TESTING

Within six months of start-up, all new or upgraded incinerator units, regardless of size, shall determine and demonstrate compliance with the limits set out in Tables 1 and 2 through source emissions testing, performed under maximum operating feed rates in accordance with the methods and procedures documented in the Ontario Source Testing Code. Thereafter, testing shall be performed once in each calendar year (annually).

Existing incinerators shall determine compliance with the limits set out in Tables 1 and 2 and existing steel manufacturing electric arc furnaces and iron sintering plants shall determine compliance with the limits set out in Table 2 through source emissions testing, performed under maximum operating feed rates in accordance with the methods and procedures documented in the Ontario Source Testing Code, within 6 months after the compliance date set out in Tables 1 and 2 as required by the appropriate legal instrument utilized to ensure compliance. Thereafter, testing shall be performed once in each calendar year (annually).

Additional source emissions testing may be required by the Director if recurring mercury or dioxin and furan emission problems occur with an operating incinerator, steel manufacturing electric arc furnace or iron sintering plant either in the context of reviewing and evaluating the CWS or this guideline, or with respect to compliance with a legal instrument enforcing compliance.

Source emissions testing for mercury shall be conducted using a method that permits the speciation of mercury present in emissions such as the Ontario Hydro method.

Source emissions testing for dioxin and furan shall be conducted using Environment Canada Methods 1/RM/2 and 1/RM/23 or US EPA Method 23, determining emissions of all of the contaminants for which Toxic Equivalency Factors (TEFs) have been established by

NATO/CCMS, and results expressed as I-TEQ using the NATO/CCMS TEFs. Compliance will be determined based on measured I-TEQ emission levels. Table 3 provides a listing of the contaminants involved, and the TEFs assigned to each contaminant.

In determining I-TEQ emission levels, where the analytical results indicate that the amount of a particular isomer of dioxin and furan, is less than the detection limit reported by the laboratory analyzing the source emission testing samples the amount of dioxin and furan shall be reported as the toxic equivalent concentration (I-TEQ) by using the reported detection limit as the amount present for that isomer. The reported detection limits are to be determined by the laboratory at the time the source emission testing samples are analyzed based on analysis of appropriate replicate low level samples or blanks. If the annual source emissions testing indicates that the concentration of dioxin and furan has remained consistently below 32 pg/Rm^3 as I-TEQ for five (5) consecutive years, then the source operator/owner may exclude dioxin and furan from the annual source emissions testing every second year as long as the concentration of dioxin and furan continues to remain below 32 pg/Rm^3 as I-TEQ.

TABLE 3: Toxic Equivalency Factors (TEFs)	
Congener	**NATO/CCMS (1989)**
PCDDs	
2,3,7,8-TCDD	1
1,2,3,7,8-PeCDD	0.5
1,2,3,4,7,8-HxCDD	0.1
1,2,3,7,8,9-HxCDD	0.1
1,2,3,6,7,8-HxCDD	0.1
1,2,3,4,6,7,8-HpCDD	0.01
1,2,3,4,6,7,8,9-OCDD	0.001
PCDFs	
2,3,7,8-TCDF	0.1
1,2,3,7,8-PeCDF	0.05
2,3,4,7,8-PeCDF	0.5
1,2,3,4,7,8-HxCDF	0.1
1,2,3,7,8,9-HxCDF	0.1

1,2,3,6,7,8-HxCDF	0.1
2,3,4,6,7,8-HxCDF	0.1
1,2,3,4,6,7,8-HpCDF	0.01
1,2,3,4,7,8,9-HpCDF	0.01
1,2,3,4,6,7,8,9-OCDF	0.001

3.1 Pollution Prevention for Biomedical Waste Incinerators

The operators of all sources affected by the Canada-wide Standards are encouraged to use pollution prevention strategies to meet or exceed the emission limits set in the Canada-wide Standards. However, in the case of biomedical waste incineration there are significant opportunities for emission reductions due to the adoption of such strategies.

In particular, operators should consider implementing mercury reduction plans including periodic mercury audits conducted after implementation of such plans. The results of the audits should evaluate measures taken such as staff training and education in the waste source/generating locations and an audit of the purchases and fate of mercury containing devices, articles and materials, including waste mercury amalgams, fluorescent lamps, switches and temperature control devices, etc.

Similarly, operators are encouraged to develop a dioxin and furan pollution prevention plan including a detailed waste input audit and a rationale describing the expected emission levels which would have been expected from wastes excluded from firing to the unit as part of the implementation of the plan.

Any pollution prevention efforts made by operators to meet the standards through means other than Abottom of stack@ control measures should be documented and should include consideration of programs/initiatives for eliminating the use of mercury-containing products where such products can enter an incinerator waste feed stream, or diverting mercury-containing wastes from the incinerator feed as well as measures taken to prevent emissions of dioxins and furans (e.g., documentation that the unit is used solely for destruction of pathological and/or cytotoxic wastes). Documentation of the effectiveness of determined efforts should include a sound estimate of the expected emissions from the facility resulting from the implementation of these measures, including a detailed rationale for the magnitude of those estimated emissions.

4. 0 REPORTING

A report on any source emissions testing performed in accordance with the requirements under section 3.0, shall be forwarded in triplicate to the ministry=s local district office within 90 days of completion of the testing. The report shall be in the format specified in the Source Testing Code, and shall include, but not be limited to:

(1) an executive summary;

(2) dates when source emissions testing was carried out;

(3) process description, records of waste composition and feed rate during the source measurement;

(4) records of operating conditions, including but not limited to:

  (1) records of all continuous emission monitoring systems, including temperature and pressure sensors, for the period when the source emission testing was taking place;

  (2) liquid and/or reagent and gas flow rates for all components of the air pollution control system;

  (3) any other records that may affect the evaluation of the source emissions testing report;

(5) procedures followed during the source emissions testing and any deviation from the proposed test protocol and the reasons therefore;

(6) the results of the analyses of the stack emissions;

(7) a summary table that compares the source emissions testing results, the monitoring data and the records of operating conditions during the source emissions testing to the requirements imposed by the Environmental Protection Act, Regulation 346 and this Guideline and which presents the estimated annual loadings of mercury and dioxins and furans (expressed as I-TEQ) from the source calculated using procedures consistent with currently accepted practices used to report emissions as required by O. Reg. 127/00.

Canadian Council of Ministers of the Environment

CANADA-WIDE STANDARDS

for

DIOXINS AND FURANS

CANADA-WIDE STANDARDS
for
Dioxins and Furans

PREAMBLE

Dioxins and Furans

Polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs), commonly known as dioxins and furans, are toxic, persistent, bioaccumulative, and result predominantly from human activity. Due to their extraordinary environmental persistence and capacity to accumulate in biological tissues, dioxins and furans are slated for virtual elimination under the *Canadian Environmental Protection Act (CEPA)*, the federal *Toxic Substances Management Policy (TSMP) and* the CCME *Policy for the Management of Toxic Substances*.

The presence of dioxins and furans in the Canadian environment can be attributed to three principle sources: point source discharges (to water, air and soil), contamination from *in situ* dioxins and furans, and loadings from the long-range transportation of air pollutants (LRTAP).

LRTAP is the focus of multilateral conventions and bilateral accords at the international level.

Dioxin and furan contamination found in soil, water, sediments, and tissues (*in situ* contamination), is the subject of national guidelines for dioxins and furans. These guidelines outline ambient or "alert levels" which may be used by jurisdictions as benchmarks for the management and monitoring of dioxins and furans already present in the environment.

Point source discharges to water have been the target of aggressive federal and provincial regulation, as well as industry innovation and change. Discharges of dioxins & furans to the aquatic environment reached non-measurable levels in 1995.

Development of the Canada-wide Standard

The Canada-wide Standards process has focussed on anthropogenic sources that are releasing dioxins and furans to the atmosphere and soil in a continuous process.

In January 1999, the Federal/Provincial Task Force on Dioxins and Furans released the *Dioxins and Furans and Hexachlorobenzene Inventory of Releases* which documented the current understanding of anthropogenic sources in Canada releasing dioxins and furans. The *Inventory of Releases* lists emissions from over 20 sectors by province and territory, and provides national summaries for each sector.

Initial efforts have focused on atmospheric releases, the most complete component of the Inventory. Six priority sectors, varying from regional to national in scope, accounting for about 80% of national emissions have been identified as priorities for early action. These are waste incineration (municipal solid waste, hazardous waste, sewage sludge and medical waste); burning salt laden wood in coastal pulp and paper boilers in British Columbia; residential wood combustion; iron sintering; electric arc furnace steel manufacturing; and conical municipal waste combustion in Newfoundland.

To date, CWSs have been developed for the coastal pulp and paper boiler and the incineration sectors. CWSs for the remaining priority sectors will be completed in 2001. Additional source sectors, many of which contribute very small amounts of dioxins and furans emissions, will also be addressed in 2001 as will releases to soil.

Development of CWSs for dioxins and furans has taken into consideration environmental benefits, available technologies, socio-economic impacts, opportunities for pollution prevention and collateral benefits from reductions in other pollutants.

In recognition of the ultimate goal of virtual elimination, pollution prevention is being encouraged as the preferred method for avoiding the creation of dioxins or reducing releases to the environment.

Wherever possible, work on the dioxins and furans CWSs has been coordinated with other ongoing processes (e.g. Mercury CWS and the Strategic Options Process). A multi-pollutant approach will be carried forward to the remaining sectors while ensuring that dioxins and furans issues are addressed and that the ultimate goal of virtual elimination is kept clearly in mind. Opportunities for a multi-pollutant approach will also be pursued as part of the implementation of the Dioxins and Furans Canada-wide Standard.

During development of the inventory, it was realized that the data on dioxins and furans is limited. The information in the dioxins and furans inventory will be refined and updated on a regular basis through a variety of sources including the National Pollutants Release Inventory (NPRI) as a means of tracking progress and as a means of identifying any future sources of releases that must be addressed.

PART 1:

Pulp and Paper Boilers Burning Salt Laden Wood

Rationale for standard

Unique to British Columbia, the burning of salt laden wood results in an annual release of 8.6 gTEQ/year to the atmosphere or 4.3 percent of the national total of dioxin and furans emissions documented in the inventory of releases prepared under the Canadian Environmental Protection Act.

As a result of mill closures and voluntary industry initiatives that have reduced atmospheric releases, the current total represents a 25% reduction from 1990 releases.

Dioxins and furans emitted from coastal pulp and paper mills are created through the burning of salt contaminated hogged fuel. Logs transported and stored in salt water take up chlorine into the bark. The bark is stripped from the logs and ground up to produce hogged fuel.

This material is then used as boiler fuel to produce heat and electrical energy for the pulp and paper process. Over 1.4 million oven dried tonnes of hogged fuel were used by the coastal pulp and paper industry in B.C. in 1998.

Nature and application:

The CWS for this sector consists of two components. The first component sets out numeric targets and timeframes for reducing emissions from new and existing boilers. This standard applies to boilers burning more than 10,000 oven dry metric tonnes per year of hogged fuel generated from wood transported or stored in salt water. All boilers currently reliant on hogged fuel generated from wood transported or stored in salt water currently consume in excess of 50,000 oven dry metric tonnes annually. As part of the implementation of this standard, procedures will be put in place to report on the salt content of the hogged fuel to ensure compliance with the standard.

The second component sets out a process for further examining pollution prevention opportunities to prevent the creation of dioxins and furans.

Numeric Target and Timeframe for Achieving Target

Dioxin and furan emissions will be less than 100 pg/m^3 TEQ for new boilers constructed after the effective date of this standard.

Dioxin and furan emissions will be less than 500 pg/m^3 TEQ for all existing boilers by 2006. "New" means a total replacement including firebox, heat transfer surfaces and air emission control equipment.

The standard for existing boilers is set pending the acquisition of further test data and controlled studies of boiler operation. Recognizing the ultimate objective of virtual elimination as set out in the Canadian Environmental Protection Act, the mill operators will voluntarily pursue further reductions in emissions during the period of the standard. In doing so the operators will conduct additional studies to identify the reasons for higher dioxin and furan emissions at some locations and explore and, as practicable, implement measures to achieve virtual elimination at all locations. Measures to be explored include physical and process modifications to prevent or reduce dioxin and furan formation as well as emission control upgrades and/or other pollution prevention measures.

Every boiler covered by this standard will be tested twice per year to determine the level of dioxin and furan air emissions for the years prior to 2003 and annually for the years 2003 and thereafter. Testing and reporting will be performed using methods and procedures acceptable to the responsible provincial ministry.

The standard for existing boilers will be reviewed in 2003 based on the results of the additional testing, the additional studies on dioxin and furan creation and opportunities to achieve virtual elimination and the examination of other pollution prevention opportunities.

Pollution Prevention Strategy

In addition to the continuing efforts of pulp and paper mill operators to capture emissions of dioxin and furans, emphasis will be placed on identifying and implementing opportunities to prevent the creation of dioxins and furans. A strategy identifying opportunities to eliminate the formation of dioxins and furans by the coastal pulp and paper industry will be developed through a multi-stakeholder process by December 31, 2001 to provide a framework for continual progress towards the elimination of dioxin and furans.

Recognizing that most opportunities for avoiding the creation of dioxins and furans fall beyond the exclusive influence of the coastal pulp and paper mill operators, preparation of this strategy must engage a wide range of stakeholders.

The range of issues to be addressed in developing the strategy could include:

- maximum allowable salt content for hogged fuel
- removal of chloride from logs
- hogged fuel washing and pressing
- options for blending hogged fuel of different salt levels
- alternatives to log handling, transportation and storage practices that rely on salt water
- impacts of the length of time entailed in transportation and storage on the salt content of hogged fuel
- inclusion of transportation modes and effects in eco-certification criteria
- in-plant opportunities to avoid creation of dioxins and furans
- alternative fuel opportunities and costs
- providing greater opportunities for market intervention by improving the understanding of the costs being imposed on the pulp and paper mills by current log handling and storage practices

Waste Incineration

Rationale for standard

Waste incineration has historically been responsible for a significant portion of the dioxins and furans emitted in Canada. The total release of dioxins and furans from this sector amounts to 44.9 g/ TEQ/y or 22.5% of the total releases to the atmosphere.

Improved exhaust gas controls to reduce emissions of acid gases and fine particulates or activated carbon injection systems have decreased emissions of both mercury and dioxins and furans from the municipal solid waste (MSW) sector. Dioxins and furans emissions from this sector are estimated to be approximately 8.4 g/yr. Many medical waste incinerators have closed for economic or environmental reasons. However, a range of medium-to small-sized facilities remain. Individually these are small sources, but as a sector they are significant, emitting an estimated 28.8 g/yr. Two additional incineration sectors, hazardous waste (7.6 g/yr) and sewage sludge (0.1 g/yr), are also addressed by the CWS.

A Canada-wide Standard for incineration of MSW in conical waste combusters in Newfoundland will be brought forward in 2001. Newfoundland has committed to reviewing the use of these facilities and to considering a phase-out strategy that will reduce emissions of dioxins and furans as well as mercury. These actions are also identified in the Mercury Canada-wide Standard accepted by the Council of Ministers in November 1999.

Actions to reduce national emissions require that any new facilities meet stringent limits, and that the bulk of the emissions from existing facilities be controlled through retrofits with control technology that is efficient at destroying dioxins and furans. Diverting waste from incinerators would result in less incineration overall and thus avoid creation of dioxins and furans. All facilities, and particularly smaller ones, may find that pollution prevention, waste segregation and diversion are options for either achieving the limit, or reducing "end-of-stack" expenditures, and during implementation all facilities should be encouraged to place a priority on reduced inputs rather than controlled releases.

Definitions:

Waste incinerator: a device, mechanism or structure constructed primarily to thermally treat (e.g., combust or pyrolyze) a waste for the purpose of reducing its volume, destroying a hazardous chemical present in the waste, or destroying pathogens present in the waste. This includes facilities where waste heat is recovered as a byproduct from the exhaust gases from an incinerator, but does not include industrial processes where fuel derived from waste is fired as an energy source as a matter incidental to the manufacture of the primary product. For the purpose of the Dioxins and Furans CWS, conical waste combusters are considered separately from other incineration sectors.

Municipal solid waste: any waste which might normally be disposed of in a non-secure landfill site if not incinerated (i.e., including non-hazardous solid wastes regardless of origin), but is not intended to include "clean" wood waste. Clean wood waste means waste from woodworking or forest product operations where the wood waste has not been treated with preservative chemicals (e.g., pentachlorophenol) or decorative coatings.

Medical waste: any waste which includes as a component any Biomedical Waste as defined in the February 1992 CCME Guidelines for the Management of Biomedical Waste in Canada, with the exception that animal wastes derived from animal health care or veterinary research and teaching establishments are excluded.

Determined efforts: Determined efforts include the ongoing review of opportunities for reductions and implementation of in-plant changes and/or emissions control upgrades that are technically and economically feasible and which confer on-going reductions in emissions. Where possible, dioxin and furan emission reductions will be determined by way of a one-time stack test conducted after implementation of the measures. Where testing is not possible or will not provide reliable results, an audit of the dioxin and furan emission reductions associated with waste diversion or other measures is an acceptable alternative. Opportunities for regional consolidation and/or phase-out of smaller facilities may also be considered.

Nature and application:
Emission limits are expressed as a concentration in the exhaust gas exiting the stack of the facility. New or expanding facilities will be expected to comply immediately with the standard, and it will be up to individual jurisdictions to determine what constitutes a significant expansion to trigger the standard. The limits for existing facilities are capable of being met using generally available technology or waste diversion. Larger facilities will be subject to stack testing as described in Annex 1 to verify compliance with the limit. Smaller medical and municipal facilities will have the option of reporting on an audit of the dioxin and furan emission reductions associated with waste diversion or other measures or conducting a one-time stack test, to illustrate progress towards the standard.

Numeric targets:
The following standards are a step towards achieving virtual elimination for dioxins and furans.

For new or expanding facilities of any size, application of best available pollution prevention and control techniques, such as a waste diversion program, to achieve a maximum concentration[1] in the exhaust gases from the facility as follows:

Municipal waste incineration	80pg I-TEQ/m^3
Medical waste incineration	80pg I-TEQ/m^3
Hazardous waste incineration[2]	80pg I-TEQ/m^3
Sewage sludge incineration	80pg I-TEQ/m^3

[1] Stack concentrations of dioxins and furans will be corrected to 11% oxygen content for reporting purposes.
[2] Hazardous waste incinerators include all facilities that burn hazardous waste including low level radioactive waste; however they do not include facilities that use waste derived fuel or used oil.

For existing facilities application of best available pollution prevention and control techniques, to achieve a maximum concentration[1] in the exhaust gases from the facility as follows:

Municipal waste incineration	
> 26 Tonnes/year[3]	80pg I-TEQ/m^3
< 26 Tonnes/year[4]	80pg I-TEQ/m^3
Medical waste incineration	
> 26 Tonnes/year[3]	80pg I-TEQ/m^3
< 26 Tonnes/year[4]	80pg I-TEQ/m^3
Hazardous waste incineration [2]	80 pg I-TEQ/m^3
Sewage sludge incineration	100 pg I-TEQ/m^3

Timeframe for achieving the targets:
Any new or expanding facility will be required to design for and achieve compliance immediately upon attaining normal full scale operation, compliance to be confirmed by annual stack testing..

Based on determined efforts in working towards virtual elimination, existing facilities will be required to meet the standards on the following schedule:

Municipal waste incineration	2006
Medical waste incineration	2006
Hazardous waste incineration	2006
Sewage sludge incineration	2005

Pollution Prevention Strategy:
In addition to the continuing efforts of waste incinerator operators to destroy or capture emissions of dioxin and furans, emphasis will be placed on identifying and implementing opportunities to prevent the creation of dioxins and furans as well as emissions of air pollutants and ash quality generally. As an initial action with shared responsibility by all jurisdictions, strategies identifying opportunities to minimize waste incineration emissions of air pollutants including dioxins and furans will be developed through a multi-stakeholder process by December 31, 2001 to provide a framework for continual progress towards the elimination of dioxin and furans.

Recognizing that many opportunities for minimizing air pollutant and ash emissions and specifically avoiding the creation of dioxins and furans fall beyond the exclusive influence of the operators of waste incinerators, preparation of this strategy must engage a wide range of stakeholders.

[3] Larger facilities must achieve this stack concentration as confirmed by annual testing.
[4] Smaller facilities must make determined efforts to achieve this stack concentration.

The range of issues to be addressed in developing the strategy could include:

- waste diversion initiatives to minimize the generation of wastes destined for disposal (waste reduction, material reuse options)
- waste segregation initiatives aimed at materials with greater potential to generate emissions of dioxins and furans or other air pollutants of concern (e.g., mercury, other heavy metals) and aimed at diverting those wastes to recycling or other non-incineration disposal options
- combustion control strategies to optimize performance of existing combustors at destroying pollutants of concern
- use of alternative disposal or treatment technologies (e.g., anaerobic digestion of wastes with material recovery and combustion of biogas)

PART 2:

Reporting on Progress:

Ministers will receive reports on progress in achieving the CWS by jurisdictions in Spring 2004 and Spring 2008. Ministers will ensure that a single public report is prepared and posted on the CCME web site for public access. The report in 2004 will reflect interim progress on achieving the CWSs. Progress on both implementation of the numeric targets and the activities applied as part of the determined efforts provisions for smaller medical waste and municipal solid waste facilities will be documented. The 2008 report will evaluate whether targets have been met and the effectiveness of the determined efforts with respect to smaller facilities. More details on reporting are available in Annex 1.

Each jurisdiction will detail the means of ensuring achievement of the CWS in a manner consistent with the typical or desired programs for the affected facility/sector, so as not to impose an unnecessary level of reporting duplication.

With a view to continuous improvement towards the goal of virtual elimination, an evaluation of the Dioxin and Furan Canada-wide Standards will be presented to Ministers in Spring 2006. The evaluation will consider new scientific, technical and economic information and provide an assessment of the need to develop the next set of CWS targets and timelines to continue progress toward virtual elimination.

ADMINISTRATION:

Jurisdictions will review and renew Part 2 and Annex 1 five years from coming into effect.

Any party may withdraw from these Canada-Wide Standards upon three month's notice.

These Canada-Wide Standards comes into effect on May 1, 2001.

Annex 1
Dioxins and Furans CWS Reporting Framework

Introduction

Under the Harmonization Accord and its Canada-wide Environmental Standards Sub-Agreement, all jurisdictions are to report to the public and to Ministers on their progress towards achieving the CWSs for dioxins and furans.

This reporting framework is intended to provide a transparent and consistent mechanism for reporting by jurisdictions in a fashion which minimizes resource requirements for government and industry alike, while maximizing the availability of information on achievement of these standards.

The framework addresses:

1) frequency, timing and scope of reporting
2) guidance as to the means of determining compliance/achievement of the CWS
3) common measurement parameters for reporting purposes
4) data management and public reporting

Frequency, timing and scope of reporting

The reporting schedule will be tied into assessing the performance of the governments in meeting the benchmarks and timelines relevant to the standards. A report in 2004 will provide a means for tracking interim progress and report on additional technical studies (e.g. technology feasibility and pollution prevention options for the coastal pulp & paper sector). The 2008 report will indicate compliance with the standards for the coastal pulp and paper boiler and incineration sectors.

Jurisdictions will submit sectoral data for inclusion in the progress reports in a timely manner. To report on achievement of the CWS, a data report along with an assessment of progress will be compiled into a single report for Ministers and a public version will be posted on the CCME web site for public access.

Reports will be limited to information on those facilities which are subject to achievement and/or compliance with the Canada-wide Standards as endorsed by the Ministers of the Environment May 1, 2001 and as implemented variously by the responsible jurisdictions or industries. This information is intended to show compliance rates and performance characteristics in a manner which documents sectoral performance as well as jurisdictional performance. It is not intended to provide a facility-by-facility record of performance.

Means of determining compliance/achievement of the CWS

The Canada-wide Standards for dioxins and furans lend themselves to achievement through voluntary action, or through compliance with regulated or legally enforceable limits. As such, it is necessary to provide some means to ensure that a level playing field exists so that the numeric value provided in the CWS is applied equally or similarly in each jurisdiction. One means to do this is to require identical compliance procedures, but this may require that some jurisdictions apply compliance procedures for dioxins and furans CWSs that are different than those used for locally determined or regulated parameters such as SO_2, PM, ammonia, etc. An example is where the dioxins and furans CWS is expressed as the average of 3 stack tests, whereas a jurisdiction may normally utilize the median value of 3 tests to determine compliance.

In an effort to streamline implementation, each jurisdiction will determine the exact means of ensuring compliance/achievement in a manner consistent with the typical or desired programs for the affected facility/sector. It is anticipated that minor variations in jurisdictional requirements will result in minimal variation across the country which is insignificant with respect to the overall reduction activities which range from 50-99% for various facilities.

Common measurement parameters for reporting purposes

Each facility report will include specific measures corrected so as to be compatible and consistent for the purposes of public reporting. Dioxin and furan emissions must be corrected for the O_2 content of gases, to ensure compliance with the standards.

Each jurisdiction will determine the sector within which each subject facility will be reported. For example, a jurisdiction may determine that a small mixed waste incinerator (for example, burning both medical and municipal waste) may be subject to either standard, based upon the preponderance of waste (>50% as one type) or based upon the provincial designation of facility type. Sectoral assignments will be updated to reflect the most recent characteristics of the facility under consideration prior to reporting.

While little confusion is likely to exist over the implementation of dioxins and furans CWSs for "greenfield" facilities, it is possible that significantly expanded or modified facilities can/should be considered as new for the purposes of achievement/compliance with the dioxins and furans CWS. It will be the responsibility of the jurisdictions to determine at which point a facility no longer qualifies as an "existing" facility and must conform to the standard for "new or expanded" facilities as a result of significant modifications/alterations to the facility operations or physical plant.

Jurisdictions must report measurements that are below the detection limit in a consistent manner. These measurements should be reported as the limit of detection.

Large facilities will generally be required to perform stack tests at an annual frequency in order to demonstrate compliance. However, jurisdictions may vary the stack testing requirements for these facilities in cases where performance has been consistently demonstrated to be below the Level of Quantification (LoQ) as defined by Environment Canada. Where five years' data has been accumulated with all results reported below the LoQ, the stack testing frequency may be revised to a biennial schedule so long as all subsequent test results remain below the LoQ. For the purpose of reporting emissions, the most recent stack test results available should be used. Jurisdictions have the responsibility of deciding whether to implement this variance for all, some or none of the source types subject to these standards.

Data management and public reporting

Reports on achieving the CWSs will include a data report and a report on achievement of the standards. Sectoral and jurisdictional specific data will be supplied in a spreadsheet format to facilitate reporting. A consolidated report will be made available to all jurisdictions and to the Ministers, along with the draft public report, prior to formal release of the public report. The public report will be released upon approval by the Council of Ministers.

Jurisdictions will provide a report in spreadsheet format so that the data report and report on achievement can be prepared along with the public report for review and approval. Reports will be prepared and distributed to all jurisdictions prior to review by Ministers. Along with the report on achievement, a draft public report will be provided for review and consideration prior to the Ministers' meeting at which public release is anticipated. That public report will be posted to the CCME web site upon approval by the Ministers. Jurisdictions are encouraged to provide reference to the CCME web site and/or pointers in their own web sites in order to ensure a single location for dioxins and furans CWSs reporting should errors/miscalculations have to be corrected at some time.

In addition to the consolidated public reporting on dioxins and furans CWSs, jurisdictions must provide a contact for facility-specific information in the advent that the public wishes to access compliance or achievement information. Such data will be supplied in a manner consistent with the normal data-reporting/compliance reporting procedures of the jurisdiction in question - the consolidated spreadsheet will not be made publicly available in that it may include proprietary (business) information.